Appendix H
Biological Evaluations

BIOLOGICAL EVALUATION (BE)
FEDERALLY LISTED SPECIES

Mark Twain National Forest
Doniphan/Eleven Point Ranger District
Shannon County, Missouri

NE Corner Project Area

TABLE OF CONTENTS

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INTRODUCTION

The purpose of this Biological Evaluation (BE) is to document the potential effects that planned management activities associated with this project may have upon federally proposed, endangered, or threatened species and their habitats within the Mark Twain National Forest (MTNF). The objectives of this BE are:

a) to ensure that Forest Service actions do not contribute to a loss of viability or cause a trend toward federal listing of any species;
b) to comply with the requirements of the Endangered Species Act and ensure that actions of Federal agencies do not jeopardize or adversely modify critical habitat of federally listed or proposed species;
c) to provide a process and standard by which to ensure that threatened, endangered, proposed, and sensitive species receive full consideration in the decision making process;
d) and to ensure compliance with Reasonable and Prudent Measures and associated Terms and Conditions outlined in the June 23, 1999 Biological Opinion on the Impacts of Forest Management and Other Activities to the Gray Bat, Bald Eagle, Indiana Bat, and Mead's Milkweed on the Mark Twain National Forest, Missouri.

Site-specific effects determinations for each species are summarized at the end of this document.

PROPOSED MANAGEMENT ACTION

Summary of Proposed Action: There would be no vegetation management in Alternative 1. The proposed action for scoping was Alternative 2. The likely preferred alternative for the NE Corner project area is Alternative 2. Specific actions identified in Alternative 2 are: designate 709 acres old growth; maintain 34 acres of open and semi-open habitat by prescribed burning; harvest 338 acres of clearcuts, 33 acres of shelterwood/seed cut, 88 acres of seed tree/seed cut, 57 acres shelterwood preparatory cut, 114 acres of salvage harvest; reforestation of 314 acres by natural regeneration, 189 acres of planting and release; 431 acres of group selection with improvement cut, which includes follow-up reforestation on 42 acres of groups and 389 acres of TSI/reforestation between groups, 1660 acres of thinning, and precommercial thinning of 439 acres; and

prescribed burning of 658 acres for Shortleaf pine woodland restoration. Alternative 3 consists of similar activities, but differs in the amount of acres for individual stand treatments. Alternative 3 does not include burning the 658 acre prescribed burn unit.

Project Location and Size: The acres evaluated in this BE for the NE Corner Project Area total 7414. The area includes: Compartments 280, 281, 282, 283, 284, 285, 286 and 287 in Township 24N, Range 3 West, Sections 1-6, 9-16, 23-28 and 36; Shannon County, Missouri.

Management Area: The sites fall within the following management unit: 4.1-12 (Shortleaf Pine Emphasis).

Land Type Association in Project Area: Oak-Pine Hills (HI) and Oak-Pine Breaks (BB).

CONSULTATION HISTORY

In 1984, the Forest Service requested formal consultation with the US Fish and Wildlife Service (FWS) on the Mark Twain National Forest Land and Resource Management Plan (Forest Plan). On August 8, 1985, FWS issued a non-jeopardy biological opinion for seven federal species. In 1998, the Forest Service reinitiated programmatic consultation for continued implementation of the Forest Plan. Further consultation was needed to incorporate information gathered about federal threatened and endangered species over the past decade. A programmatic Biological Assessment (BA), that included ten federal species, was submitted to FWS in September 1998. Determinations of no effect or not likely to adversely affect were made for six of the ten species. These determinations were concurred with by FWS during informal consultation. On June 23, 1999, FWS issued a non-jeopardy Biological Opinion (BO) that included the other four federal species.

CRITICAL HABITAT

There is no critical habitat for any federally listed species in the project area, the Doniphan/Eleven Point Ranger District, or the Mark Twain National Forest.

SPECIES CONSIDERED AND EVALUATED

Twelve species are considered in this BE. These species represent the list of federal species identified by the FWS in their letter to the Forest Supervisor, dated 31 July 2002, as being near or on the Mark Twain National Forest. All ten of the species considered in the programmatic BA/BO are included in this list of 12 species.

Species Considered but Dismissed from Further Evaluation: Of these twelve species, the following nine species are not discussed in detail in this BE. These species would not be affected by this project because the project area is not within the documented range of

the species or they do not have suitable habitat within the project area. The Missouri Heritage Database indicated that none of the 12 federal species considered are known to occur within the NE Corner Project Area.

- ***Topeka shiner*** *(Notropis topeka)* is found in only a few drainages north of the Missouri River. This species' range is several hundred miles from the NE Corner Project Area. The only district that has potential to affect this species or its habitat is Cedar Creek.

- ***Tumbling Creek cavesnail*** *(Antrobia culveri)* is found only in one privately-owned cave in Taney County, Missouri. The only district that has potential to affect this species or its habitat is Ava.

- ***Mead's milkweed*** *(Asclepias meadii)* is found on National Forest land only on the Potosi District. This species is documented from one glade system within the Bell Mountain Wilderness in Iron County, over 40 miles northeast of the NE Corner Project Area. The only district that has potential to affect this species or its habitat is Potosi/Fredericktown.

- ***Running buffalo clover*** (*Trifolium stoloniferum)* habitat is semi-shaded open woods. This plant requires slight periodic soil disturbance for survival. Some populations do occur in areas of full sun. A review of the Missouri Heritage database showed no documented locations for running buffalo clover in the NE Corner Project Area. There are no naturally occurring wild populations of this species known to occur on the Mark Twain National Forest. In the early 1990's, it was introduced to 11 sites on the MTNF. In 1997, only four of these sites still had living plants. None of the sites are in or near the NE Corner Project Area.

- ***Curtis' pearly mussel*** (*Epioblasma florentina curtisi*) historic range includes the Little Black River (just east of the Doniphan/Eleven Point District). This species has been limited to a 6-mile stretch in the Little Black River. No specimens have been documented since 1993 when a single male was found in the Little Black River. In 1996, this species was considered "on the brink of extinction" and recovery was considered unlikely. There are no permanent streams or rivers in the NE Corner Project Area and thus no potential habitat for this species.

- ***Pink mucket pearlymussel*** (*Lampsilis abrupta*) inhabits shallow riffles or shoals in areas of gravel, rubble or sand substrates that have been swept free of silt by the current in medium to large rivers and streams that offer good water quality. In a 1981-82 survey, the pink mucket pearly mussel was found in the lower Current River in Arkansas. There have been no records of the pink mucket pearly mussel occurring on the Doniphan/Eleven Point District and there are no permanent streams or rivers in the NE Corner Project, and thus no potential habitat for this species.

- ***Scaleshell mussel*** (*Leptodea leptodon*) inhabits medium-sized and large rivers with stable channels and good water quality. This species currently exists 14 rivers, including the Meramec, Big, Bourbeuse, Osage and Gasconade rivers in Missouri. There are no records of the scaleshell mussel occurring on the Doniphan/Eleven Point District and there are no permanent streams or rivers in the NE Corner Project, and thus no potential habitat for this species.

- ***Hine's emerald dragonfly*** *(Somatochlora hineana* Williamson*)* habitat is fens fed by calcareous groundwater seepage with underlying dolomite bedrock. This species has been found in at least 8 locations in Missouri, including at least three sites in Reynolds and Iron counties. In August of 1999, a single specimen of Hine's emerald dragonfly, was legally collected at a prairie fen at Grasshopper Hollow Natural Area in Reynolds County (owned by Doe Run Mining Company and leased to The Nature Conservancy) adjacent to Mark Twain National Forest. Specimens were identified in that same location in the summer of 2000 and at two deep muck fens, Barton Fen, Potosi District, and Ruble Meadow, a private site in Reynolds County, in 2001. There is no designated critical habitat for this species, but there is an approved Recovery Plan dated September 27, 2001. There are no known fens, calcareous seeps, or wetlands meeting the habitat requirements within the NE Corner Project Area.

- ***Ozark hellbender*** (*Cryptobranchus allegeniensis bishopi)* can be found in slow moving rivers. It has been identified in the Current and Eleven Point rivers on the Doniphan-Eleven Point Ranger District, as well as the North Fork of the White River in Willow Springs, Missouri. There are no permanent streams or rivers in the NE Corner Project Area, and thus no potential habitat exists for this species area.

SURVEY INFORMATION

In partnership with the Mark Twain National Forest and others, the Missouri Department of Conservation has been very aggressive in conducting species surveys and maintaining data on both listed and common species. The Missouri Heritage Database (http://www.conservation.state.mo.us/cgi-bin/heritage/index.html) not only includes specific locations of plant and animal species, but also includes occurrences of unique and/or rare natural communities. Many of these communities are suitable habitat for federally listed species. This database provides an excellent and up-to-date source of information on occurrences of Threatened and Endangered (T&E) species. According to the Missouri Heritage Database, both the gray bat and Indiana bat are known to exist in Shannon County. **However, there have been no documented occurrences of any T&E species in the NE Corner Project Area on National Forest lands.**

The Missouri Fish and Wildlife Information System (MOFWIS) (http://www.conservation.state.mo.us/nathiso/mofwis) includes information on over 700 species of animals and plants (life history, status, known and possible locations, etc.).

This database is also an excellent source of information regarding possible locations of T&E species on the Mark Twain National Forest. **Federally listed species described in the Missouri Fish and Wildlife Information System as known or likely to occur in Shannon County are the bald eagle, gray bat and Indiana bat.**

Species experts in Missouri have also been very aggressive in publishing excellent reference material that includes species locations in the state as well as potential habitat. Publications include: Missouri Wildflowers, Missouri Orchids, Field Guide to Missouri Ferns, Walk Softly Upon the Earth (lichens and mosses), Steyermark's Flora of Missouri, Flora of Missouri, Volume 1, Butterflies and Moths of Missouri, The Crayfish of Missouri, The Fishes of Missouri, Naiades of Missouri, Birds of Missouri, and The Amphibians and Reptiles of Missouri.

Natureserve, a non-profit organization, provides specific information on species locations, habitats, threats, propagation, life history, etc. The Natureserve explorer website (http://www.natureserve.org/explorer/) contains detailed information on a variety of species and natural communities.

In addition to the extensive fieldwork done in preparation of the Missouri Heritage and MOFWIS databases and the publications, there are numerous field surveys conducted annually or as part of research projects in Missouri. The Mark Twain National Forest has also conducted surveys in partnership with others and on its own. Examples of these include, but are not limited to:

- Annual mid-winter bald eagle surveys
- Annual bald eagle nest surveys
- Forest bat surveys (cave, fall, summer, winter, mist-net, harp-trap, Anabat)
- Missouri Breeding Bird Atlas
- Missouri Breeding Bird Survey Routes
- Cave Research Foundation Biological Inventories
- Gardner & Gardner Cave Inventories
- Botanical Surveys
- Naiades survey 1980-1982

I visited the project area with Zone 2 FMO, Ben Wyatt, to discuss the prescribed burning of approximately 658 acres for shortleaf pine woodland restoration in compartments 284 and 285. I also visited the project area with Silivculturist, Don Fish, to discuss some of the treatments and old growth designations.

This analysis of effects upon federally listed species is based upon information obtained during surveys that have been conducted in the vicinity of this project, as well as an assumption that habitat for the species addressed in detail may exist within or in close proximity to the NE Corner Project Area. Site-specific effects and information about the suitability of existing conditions were determined in this BE based on documented occurrences, various publications discussed above, information gathered from other Forest Service personnel concerning the project area, and databases such as MOFWIS,

the Heritage Database, CDS and ArcView. These sources, along with site visits and other pertinent information, were used to analyze the potential effects on T&E species in the NE Corner Project Area.

Species Considered in Detail: Those federal species known to occur or have potentially suitable habitat within the NE Corner Project Area are selected for detailed analysis and include:

Status	Common Name	Scientific Name	Associated Habitat
Endangered	Gray bat	*Myotis grisescens*	Caves; riparian areas
Endangered	Indiana bat	*Myotis sodalis*	Caves; forests
Threatened	Bald eagle	*Haliaetus leucocephalus*	Riparian areas, lakes, reservoirs

ENVIRONMENTAL BASELINE

Gray Bat

General habitat requirements – Gray bats roost in colonies in a wide variety of caves throughout the year, including different caves during the summer and winter months. Because of their high dependence upon caves for roosting and reproduction, this species is most vulnerable to activities that could disturb or negatively alter their cave environment, as only 5% of caves are suitable for gray bat use. Foraging habitat for gray bats generally consists of forested riparian areas and/or over open water of rivers or lakes, generally up to 12 miles from their caves. For both foraging and roosting, gray bats are generally restricted to areas in close proximity to rivers, lakes, and large streams.

Distribution on the MTNF – There are at least 14 known gray bat caves on the Mark Twain National Forest, with at least six located on the Doniphan/Eleven Point Ranger District (Missouri Heritage Database). Mist netting of forest bats was conducted in the spring-fall of 1997, 1998, 1999, 2001 and 2002 on several Mark Twain National Forest locations. A few gray bats were caught at several locations. Harp trapping was also conducted at known gray bat cave entrances in the fall of 1997, 1998, 1999 and 2001. Gray bats were also caught during these efforts. Population counts are conducted at gray bat caves in cooperation with the Missouri Department of Conservation bat biologist. Population estimates have been as high as 45,900 in one of the caves in recent years. A September 2002 survey on Corps of Engineers land at Wappapello Lake, near the Poplar Bluff Ranger District, resulted in the capture of 5 gray bats, which are believed to have been caught during migration, as no cave was located that could support a population.

Occurrence within project area – Most gray bat caves are known to be within a mile or two from a river or lake that has suitable foraging habitat. The closest documented gray bat cave lies 9 miles to the northeast of the project area, along the Ozark National Scenic Riverways corridor. The closest gray bat cave on the MTNF is approximately 10.5 miles south of the project area. There are no known caves within the NE Corner Project Area;

therefore any activities within the NE Corner Project Area are not near any cave passages. In addition, there are no perennial streams or rivers within the project area. Sycamore Creek and Pike Creek are intermittent losing streams that run through the project area. Gray bats do forage along the Current River. While gray bats have been known to forage several miles from their caves, it is not likely that a gray bat would travel to an intermittent stream to forage when their cave is in close proximity to the river.

In addition, the gray bat population is stable or increasing to the point that the FWS is reviewing its current status to determine if downlisting is warranted.

Indiana Bat

General habitat requirements – The Indiana bat occupies a wide variety of roost sites and environments. The Indiana bat roosts in caves, where it is protected from winter temperature extremes during the hibernation period (generally November – March). Outside the winter period, the Indiana bat frequents areas outside its caves and utilizes standing snags and loose bark trees as roost sites and maternity colony sites. Generally, the male's summer roost trees are located within 5 miles of an occupied cave, found in forested areas with some canopy gaps that allow moderate sunlight to warm roost trees. Until recently, all known female maternity roost trees in Missouri had been located north of the Missouri River in the prairie regions of Missouri, and not on or near the Mark Twain National Forest. Another known maternity colony is in Illinois, along the Mississippi River corridor.

Distribution on the MTNF – The entire Mark Twain National Forest is within the documented range of the Indiana bat throughout the year. There are only two Indiana bat hibernacula (caves) known on the Mark Twain National Forest, one of which is located on the Doniphan/Eleven Point Ranger District within the Irish Wilderness. When not hibernating, roosting male and female Indiana bats may occur anywhere on the National Forest where suitable habitat exists. In 6 years of spring-fall mist netting on the Mark Twain National Forest, no Indiana bats had been captured. In May 2003, the first reproductively active female Indiana bat was captured on the MTNF. The capture was at the Silver Mines Recreation Area in Madison County on the Potosi/Fredericktown District, approximately 10 miles from the closest hibernaculum. This is a likely indicator that maternity colonies do exist on the National Forest. The capture was located approximately 55 miles northeast of the project area. There is no designated critical habitat for this species on the Mark Twain National Forest. A September 2002, survey on Corps of Engineers land at Wappapello Lake, near the Poplar Bluff Ranger District, resulted in the capture of 3 Indiana bats.

Occurrence within project area – The nearest known Indiana bat hibernacula is located within the Irish Wilderness and is 16.5 miles south of the project area. The highest number of Indiana bats known to hibernate in this cave was 39. In 1998, 22 Indiana bats were found hibernating in this cave. Harp trapping at the cave entrance in the fall of 1998 resulted in the capture of one male Indiana bat in 3 hours. During the most recent

survey, conducted in February 2001, only 1 Indiana bat was found hibernating in this cave. The cave is considered a priority 3 cave in the Indiana bat Recovery Plan, but the cave is shown on USGS Topographical maps and is well-known among local residents and repeat visitors to the river. The cave is gated and locked from September 15 through April 30 to prevent human disturbance. Mist-netting from 1997 – 1999, 2001 and 2002 failed to capture any Indiana bats on the Doniphan/Eleven Point District.

Winter habitat – Indiana bats require specific roost sites in caves or abandoned mines that attain proper temperatures to hibernate successfully. Humidity and cave configuration also play a part in the suitability of a particular hibernacula. There is no winter habitat available in the Northeast Corner Project Area. There are no known caves within the project area.

Summer male habitat – The closest part of the project area is approximately 16.5 miles north of the documented occupied Indiana bat cave, therefore no portion of the project area is included in the Area of Influence for that cave. It is unlikely that males would use this area for foraging or roosting because of the distance from the hibercaculum. Typically, males remain close to their hibernacula, where they roost and forage in the adjacent forest, as they are most commonly found within 1-3 miles of the entrance of the hibernacula.

Upland forest in the NE Corner Project Area is composed primarily of Oak and Shortleaf Pine from 40- 89 years old. There are some younger stands and some areas of old growth forest.

Male bats forage in the forest canopy, both in riparian and upland forests. Indiana bats also forage over old fields, along borders of cropland, along wooded fencerows and over farm ponds in pastures. Open woodlands (50-70% canopy closure) with a relatively open understory is preferred foraging habitat. Dense forest canopy (greater than 70%) may make it difficult for bats to capture their insect prey.

The NE Corner Project Area is 97% forested. Within the project area, there are dead trees, cavity trees, trees with flaking bark and others that would be suitable for roosting. It is unlikely that roosting, with the possible exception of migration during spring and fall, would take place in the NE Corner Project Area, because of the distance from known hibernacula and maternity sites.

Summer maternity habitat: The project area is approximately 55 miles southwest of the nearest documented capture of a reproductively active female Indiana bat and over 200 miles south of the nearest documented maternity colony in Missouri. There are no perennial streams or rivers within the project area and no riparian habitat. Alluvial habitat is associated with upland waterways that are found within the project area.

Fall swarming habitat: The project area is approximately 16.5 north of the nearest documented Indiana bat hibernacula. In fall, both males and females return to hibernacula and mate before beginning hibernation. During fall swarming, bats forage

and may roost outside the cave entrances. Indiana bats generally stay fairly close to the cave at this time, with the majority usually found 1-3 miles from cave entrances in the fall. The most recent survey of this hibernaculum was completed in 2001 and only one Indiana bat was found.

Bald Eagle

General habitat requirements – Bald eagles are most often associated with areas near large bodies of water, such as rivers, lakes and reservoirs. In the winter, bald eagles tend to congregate in these areas and roost communally, often in a tree in a ravine or other wind-protected areas. In the summer, bald eagles prefer to nest in a floodplain forest where the largest, stoutest tree or a coniferous or dead tree are most often selected as the nesting tree. Once a nest tree is established, bald eagles may use it for several years. Usually, the nest site has a clear flight path to a water sources and is within 0.5 miles of water. Bald eagles feed primarily on fish, but will also take other prey, including waterfowl, small mammals, and carrion.

In Missouri, wintering bald eagles are typically present between November and March. Nest activities may start as early as January, with young rearing lasting until mid-June to July when young typically fledge.

Distribution on the MTNF – Bald eagles are frequently observed singly or in small groups along major water bodies and rivers on the Mark Twain National Forest during the winter months. Communal night roosts, associated with wintering sites, have yet to be reported on the Mark Twain National Forest. The nearest communal night roost to the NE Corner Project Area is 16 miles and is located on private land. The nearest active eagle nest is 18.5 miles from the project area and is located near Thomasville on private land on the banks of the Eleven Point River, but within the Eleven Point National Scenic River easement. An abandoned nest was also found on the Eleven Point River. Potential for nesting eagles exists in the habitats that are frequently utilized during the winter months.

Occurrence within project area – Bald eagles winter along the Eleven Point and Current Rivers within the Doniphan/Eleven Point Ranger District. In the most recent bald eagle surveys, conducted between December 2002 and February 2003, along the Current and Eleven Point Rivers, as many as 44 bald eagles were counted along the river corridors. There were no communal night roosts or nests identified throughout these stretches of river or at any access points surveyed. On April 25, 2003, Assistant Fire Management Officer, Tim Perren, and Keith Kelley, Wildlife Biologist, conducted nest observations of the known eagle nest on the Eleven Point River. The nest was located approximately 1.5 miles downstream from the Thomasville launch site on the north bank of the Eleven Point River.

While the nest lies within the scenic river easement, it is located on private property owned by Shaw Enterprises. A single adult was observed at the nest, but no eaglet could be seen. On May 9, 2003, a return visit was made by canoe to observe the nest from the

river. An adult and one eaglet were observed being active in and around the nest. A second nest was identified several miles downstream, but it was determined to be abandoned. Since this species has met and exceeded the Recovery Goals outlined in the Northern States Bald Eagle Recovery Plan, it has been downlisted from Endangered to Threatened and is being proposed for delisting. The district silviculturist, heritage resource paraprofessional and others have conducted field surveys of the NE Corner Project Area and have not seen any bald eagles during the visits. There are no perennial streams or rivers within the project are and there is no evidence of any night roosts or nests in the NE Corner Project Area.

There is no bottomland hardwood forest located in the project area and no riparian habitat, because there are no perennial stream or rivers. Upland oak-pine, pine, and mixed oak cover most of the project area. Approximately 77% is between 40-89 years old with approximately 3% over 90, where super canopy trees would form. The age structure naturally limits the number of suitable roosting and nesting trees within the NE Corner Project Area.

EFFECTS OF THE PROPOSED ACTION AND ALTERNATIVES:

Gray Bat

Direct and Indirect Effects: The following table identifies the potentially affected acres that are proposed by alternative for the NE Corner Project Area. The amount of each action is shown by Alternative. The actions proposed in Alternatives 2 and 3 would be implemented over a 5-year period beginning the year the decision is made.

Action	**Alt 1**	**Alt 2**	**Alt 3**
Timber harvesting	0	2721 acres	2660 acres
Road maint/ reconstruction	0	21.1 miles	21.1 miles
Prescribed burning	0	692 acres	34 acres

Timber harvest, road maintenance/reconstruction, prescribed burning and human visitation at caves were all considered and analyzed in the programmatic BA and BO as activities needed to implement the Forest Plan. There are no activities proposed in any alternative in the NE Corner Project Area that were not discussed in the BA/BO.

Human entry into occupied gray bat caves - There are no known caves in the NE Corner Project Area. Therefore, there would be no effect in any alternative.

Timber harvest – Timber harvest was one of the activities identified as having potential to cause excess soil movement resulting in an indirect effect to gray bats through water

quality degradation and prey base loss. All timber harvest methods considered in the NE Corner Project Area alternatives were also considered in the BA/BO. Timber harvest effects are discussed on gray bat pages 10-12 of the BA and pages 21-22 of the BO. Timber harvest in the NE Corner Project Area would be done using the same standards and methods as described in the BA/BO; therefore, effects in the project area would be expected to be the same as those described in the BA/BO.

There would be no effects in Alternative 1. There would be no potential for indirect effects, since no harvest would be done and there would be no movement of soil or sedimentation.

Effects for Alternatives 2 and 3 differ in the acres affected for timber treatments and acres for prescribed burning and some individual stand prescriptions, but not in the type of effect. All harvest types proposed in the project area were considered in the BA/BO. The potential for soil movement off-site exists with any timber harvest activity. Impacts are likely to be minimal because no harvest will occur within riparian corridors. In addition, the standards and guidelines outlined in the Land and Resource Management Plan (LRMP) for the MTNF provide mitigation measures that minimize soil erosion and maintain good water quality. Areas not harvested act as filter strips to prevent soil loss. Within the NE Corner Project Area approximately 63% would be unaffected by timber harvest. While the NE Corner Project Area is within the Current River watershed, it is unlikely that water quality in the Current River would be affected because of the distance to the river and the large amount of forested acres between the project area and any waterway. Therefore there would be no indirect effects on the gray bat prey base.

Road maintenance/reconstruction – Road maintenance/reconstruction was one of the activities identified as having potential to cause excess soil movement, resulting in indirect effects to gray bats, through water quality degradation and prey base losses. Road maintenance/reconstruction are discussed on gray bat pages 11-12 of the BA and pages 21-22 of the BO. Road maintenance/reconstruction in the NE Corner Project Area would be done using the same standards and methods as described in the BA/BO; therefore, effects in the project area would be expected to be the same as those described in the BA/BO.

With no road maintenance in Alternative 1, there would be potential for erosion from poorly maintained roads. However, it is unlikely that there would be enough soil movement to cause indirect effects by adversely affecting the gray bat prey base.

Alternatives 2 and 3 have 21.1 miles of road maintenance/reconstruction. Most roads on the MTNF are ridgetop roads with high clay/rock content. Rocks serve as filters to trap small particles to reduce movement off-site. High clay content binds soil particles, which too reduces the amount of particles that move off-site. Most of the roads within the NE Corner Project Area to be maintained/reconstructed are ridgetop roads.

Maintenance of the roads within the NE Corner Project Area will reduce the erosion potential and thereby will not contribute to water quality degradation of the Current

River. The gray bat prey base would not be affected because of the lack of erosion through properly maintained roads.

Prescribed burning – Smoke inhalation in occupied caves is identified as one of the activities identified as a possible effect to gray bats in the BA/BO. Prescribed burning was identified as one of the activities that has potential to cause excess soil movement, resulting in indirect effects to gray bats, through water quality degradation and prey base losses. Prescribed burning is discussed on gray bat page 13 of the BA and pages 21-22 of the BO. Prescribed burning in the NE Corner Project Area would be done using the same standards and methods as described in the BA/BO; therefore, effects in the project area would be expected to be the same as those described in the BA/BO.

There would be no effects in Alternative 1 (No Action).

Alternative 2 has 692 acres to be burned, while Alternative 3 has 34 acres. Under Alternative 2, 658 acres of pine woodlands would be restored as well as 34 acres of open lands. Under Alternative 3, only 34 acres of native warm season grasses would be burned.

The closest documented gray bat cave lies 9 miles to the north of the project area, along the Ozark National Scenic Riverways corridor. Most prescribed burns are conducted in the fall-spring when gray bats are typically in caves. If prescribed burns were conducted in the project area with a southwest wind there is a potential for smoke to drift into the Current River corridor. Prescribed burn are usually completed when weather conditions are conducive to smoke dispersal with minimum requirements for mixing height and transport winds. Normally, smoke dissipates within 24 hours and it is highly unlikely that smoke would drift and enter a cave in sufficient volume to affect gray bats.

Prescribed burns on the MTNF generally leave little, if any, soil exposed after the burn is completed. Mitigation measures, as described in the burn plans, will reduce the chance of soil loss on firelines. Approximately 91% of the NE Corner Project Area would be unaffected by prescribed burning with Alternative 2, and greater than 99% would be unaffected under Alternative 3. Therefore, all of the remaining forested acres would provide a filter to reduce the chances for soil to move off-site.

Cumulative Effects: Activities in the past 2 decades in the NE Corner Project Area include other timber harvests, wildfire and wildfire suppression, wildlife habitat improvement, and road construction and maintenance. Activities under Alternatives 2 and 3 include timber harvest, road maintenance/reconstruction and prescribed burning. Other future actions or projects on the Doniphan/Eleven Point District include prescribed burning of the DD Savanna, which is 1 mile south of the NE Corner Project Area, but 4 miles south of the 658 acre unit proposed for shortleaf pine woodland restoration in Alternative 2. Approximately 57% of the NE Corner Project Area would have no treatment under Alternative 2 and 56% would have no treatment under Alternative 3. It is unlikely that sediment, in sufficient quantity to affect water quality would move off site. It is also unlikely that smoke would affect any occupied gray bat caves in sufficient

quantities to affect gray bats. There are no caves, permanent streams or rivers in the project are that may affect or be affected by this project.

Peck Ranch State Conservation Area (23, 098 acres) borders the NE Corner Project Area on the east side. Management activities within this area include prescribed burning of warm season grasses, dolomite glades, igneous knobs and pine woodland restoration sites. An average of 2000 acres are burned annually. Expectations are to burn 52%, approximately 12,000 acres, of the Conservation Area on a rotational basis. Prescribed burning has been conducted for several years in conjunction with silvicutural practices that are very similar to the practices identified in the LRMP for the MTNF.

Approximately 3281 acres, 30% of the total acres within the project area, are private lands within the project area boundary. Private citizens own approximately 93% of the lands in Missouri; therefore resident species rely heavily on habitat conditions available on private lands. While there are no actions currently known that will occur on private lands, it is likely that the pattern of use that has been established will continue. This will include pasturing, timber harvesting and re-growing of cut lands, with much of the lands expected to be left in their current conditions.

The patterns of land use on National Forest, state and private lands have been fairly consistent for the past decades. Since there are no known direct or indirect effects as a result of this project and based upon known past, present and foreseeable effects, this project is not expected to have a cumulative effect upon the gray bat or its habitat.

Findings of BO Compliance: The June 23, 1999 Biological Opinion requires compliance with Terms and Conditions developed to protect and maintain the gray bat and its habitat on the MTNF. Human disturbance and prescribed burning are listed as potential direct effect to this species. Timber harvesting, road construction/maintenance and prescribed fires are listed as actions that may cause indirect effects to gray bats. This proposed project has the same effects as those discussed within the BO. The Reasonable and Prudent Measures (RPM) and associated Terms and Conditions (TC) are being met, including the following:

- The project is not likely to result in disturbance to any gray bat caves.
- The project does not inhibit ongoing monitoring of gray bat populations.
- The project does not impact the 20 acres of designated old growth around occupied gray bat caves or foraging corridors.
- The project does not involve or influence controlled burning activities that may impact gray bat caves.

Determination of Effect and Rationale: The NE Corner activities (all alternatives) at the locations described in this document <u>may affect</u> but are <u>not likely to adversely affect</u> the gray bat. There will be no additional effects outside those discussed and evaluated in the programmatic Biological Assessment or Biological Opinion.

Indiana Bat

Direct and Indirect Effects: The following table identifies the potentially affected acres that are proposed by alternative for the NE Corner Project Area. The amount of each action is shown by Alternative. The actions proposed in Alternatives 2 and 3 would be implemented over a 5-year period beginning the year the decision is made.

Action	**Alt 1**	**Alt 2**	**Alt 3**
Timber harvesting	0	2721 acres	2660 acres
Timber Stand Improvement	0	828 acres	1032 acres
Road maint/ reconstruction	0	21.1 miles	21.1 miles
Prescribed burning	0	692 acres	34 acres

Timber harvest, road maintenance/reconstruction, prescribed burning, wildlife habitat improvement and timber stand improvement were all considered and analyzed in the programmatic BA and BO as activities needed to implement the Forest Plan. There are no activities proposed in any alternative in the NE Corner Project Area that were not discussed in the BA/BO.

Timber harvest – The removal of potential roost trees used by a maternity colony, summering males adjacent to active hibernacula, migrants during spring and fall migration of both sexes during the fall swarming period were identified as a potential direct effects to Indiana bats. The decrease in forage base from the loss of foraging habitat and the loss of species' prey base because of the degradation of streams and rivers were identified as possible indirect effects to Indiana bats. All timber harvest methods considered in the NE Corner Project Area alternatives were also considered in the BA/BO. Timber harvest effects are discussed on Indiana bat pages 19-25 of the BA and pages 62-65 of the BO. Timber harvest in the NE Corner Project Area would be done using the same standards and methods as described in the BA/BO; therefore, effects in the project area would be expected to be the same as those described in the BA/BO.

With Alternative 1, there would be no short-term effects. Indiana bats' optimum foraging habitat is 50-70% canopy closure. The canopy in the NE Corner Project Area would eventually near 100% closure with the no action alternative. The end result would reduce the amount of potential foraging habitat.

Effects of timber harvest in Alternatives 2 and 3 vary only in the amount of area affected. All harvest and tree removal activities have the potential to remove suitable roost trees or

cause direct mortality or injury to individuals or small groups of roosting bats. The likelihood of this occurring is extremely low because of the large number of suitable roost trees on the MTNF, and the rarity and wide dispersal of the species throughout its range. Under Alternatives 2 and 3, approximately 63% of the NE Corner Project Area would have no timber activity and old growth forest would be designated in portions of the project area. Timber harvest activities in Alternatives 2 and 3 will meet the terms and conditions of the BO.

Activities within the NE Corner Project Area that reduce canopy closure below 30% include clearcut, seed tree seed cut and shelterwood seed cut. The acres affected by these harvests are 459 acres in Alternative 2 and 499 acres in Alternative 3. These areas would be less than preferred foraging habitat. Preferred foraging habitat would be created and maintained in areas where UEAM harvest, commercial thinning and pine woodland development activities occur. The acres affected by these are 2749 acres in Alternative 2 and 1923 acres in Alternative 3. These areas would have canopy closures within the 50-70% range, which is considered optimum foraging conditions Indiana bats.

It is unlikely that Indiana bats would use the NE Corner Project Area for suitable roosting trees because of the distance to occupied hibernacula, even if preferred foraging habitat and suitable roosting trees are available.

Timber Stand Improvement (TSI) – Removal of trees was identified in the BA/BO as a potential effect to Indiana bats. Timber stand improvement in the NE Corner Project Area would be done using the same standards and methods as described in the BA/BO; therefore, effects in the project area would be expected to be the same as those described in the BA/BO.

There would be no effects in Alternative 1.

Effects for Alternatives 2 and 3 would be the similar. The acres of TSI that would be implemented for Alternative 2 and 3 are 828 and 1032, respectively. Trees typically ranging from 3-7" diameter would be cut and left on the ground in the areas affected. While there is a potential for Indiana bats to roost in these trees, many other suitable roost trees would remain in the project area. If the work was completed in the late fall, there would be no potential, since the bats would be hibernating. Even if the work was completed in the spring or summer it would be unlikely that bats would be roosting in the NE Corner Project Area, because of the distance from documented hibernacula.

Road maintenance/reconstruction – Road maintenance/reconstruction was one of the activities was one of the activities identified as having potential to cause excess soil movement, resulting in indirect effects to Indiana bats, through water quality degradation and prey base losses. Road maintenance/reconstruction are discussed on Indiana bat pages 19-25 of the BA and pages 63-64 of the BO. Road construction may also result in the removal of individual trees that could be potential roosting sites. Road maintenance/reconstruction in the NE Corner Project Area would be done using the same

standards and methods as described in the BA/BO; therefore, effects in the project area would be expected to be the same as those described in the BA/BO.

With no road maintenance in Alternative 1, there would be potential for erosion from poorly maintained roads. However, it is unlikely that there would be enough soil movement to cause indirect effects by adversely affecting the Indiana bat prey base.

Alternatives 2 and 3 have 21.1 miles of road maintenance/reconstruction. Most roads on the MTNF are ridgetop roads with high clay/rock content. Rocks serve as filters to trap small particles to reduce movement off-site. High clay content binds soil particles, which too reduces the amount of particles that move off-site. Most of the roads within the NE Corner Project Area to be maintained are ridgetop roads.

Maintenance of the roads within the NE Corner Project Area will reduce the erosion potential and thereby will not contribute to water quality degradation of the Eleven Point River. The Indiana bat prey base would not be affected because of the lack of erosion through properly maintained roads.

Prescribed burning – Direct effects to Indiana bats may occur when bats are using trees for roosting or when prevailing winds drift smoke into hibernacula. Tree removal was previously discussed. Prescribed burning is identified as an activity that could result in direct mortality to Indiana bats, by incineration of actual roost trees or by smoke inhalation. Prescribed burning and its effects are considered on Indiana bat pages 18 – 19 of the BA and 62-65 of the BO. Prescribed burning also has potential to cause excess soil movement, resulting in indirect effects to Indiana bats, through water quality degradation and prey base losses. Prescribed burning in the NE Corner Project Area would be done using the same standards and methods as described in the BA/BO; therefore, effects in the project area would be expected to be the same as those described in the BA/BO.

With Alternative 1, there would be no short-term effects. Conversely, Indiana bats' optimum foraging habitat is 50-70% canopy closure. The canopy in the NE Corner Project Area would eventually near 100% closure with the no action alternative. The end result would reduce the amount of potential foraging habitat. Prescribed fires also decrease dense understory that may inhibit movements to foraging habitats and roosting sites.

Alternative 2 has 692 acres to be burned, while Alternative 3 has 34 acres. Under Alternative 2, 658 acres of pine woodlands would be prescribed burned for restoration, as well as 34 acres of open lands. Under Alternative 3, only 34 acres of native warm season grasses would be burned. With Alternative 3, there would be no direct effects, because only open lands would be burned.

The closest known Indiana bat cave is within the Irish Wilderness and is approximately 16.5 miles from the nearest prescribed burn unit. Most prescribed burns are conducted in

the late fall to early spring before Indiana bats leave their hibernacula. Prescribed burn are usually completed when weather conditions are conducive to smoke dispersal with minimum requirements for mixing height and transport winds. Normally, smoke dissipates within 24 hours and the NE Corner Project Area is far enough from any hibernacula that there would be no effect on the cave.

While prescribed burning has the potential to kill or damage living trees, prescribed burns are planned to topkill saplings not overstory. For fires that do kill trees from intense heat, the dead trees have the potential to develop cavities and will begin to lose bark. These trees may become suitable roost trees.

Cumulative Effects: Activities in the past 2 decades in the NE Corner Project Area include other timber harvests, wildfire and wildfire suppression, wildlife habitat improvement, and road construction and maintenance. Activities under Alternatives 2 and 3 include timber harvest, road maintenance/reconstruction and prescribed burning. Other future actions or projects on the Doniphan/Eleven Point District include prescribed burning of the DD Savanna, which is 1 mile south of the NE Corner Project Area, but 4 miles south of the 658 acre unit proposed for shortleaf pine woodland restoration in Alternative 2. There are no caves, permanent streams or rivers in the project area.

The NE Corner Project Area is approximately 97% forest cover. Alternative 1 would result in the nearly 100% canopy closure of the project area, which would reduce the preferred foraging habitat. However, Alternatives 2 and 3 would create 2749 and 1923 acres, respectively of habitat with 50-70% canopy closure, optimum for Indiana bats.

Peck Ranch State Conservation Area (23, 098 acres) borders the NE Corner Project Area on the east side. Management activities within this area include prescribed burning of warm season grasses, dolomite glades, igneous knobs and pine woodland restoration sites. An average of 2000 acres are burned annually. Expectations are to burn 52%, approximately 12,000 acres, of the Conservation Area on a rotational basis. Prescribed burning has been conducted for several years in conjunction with silvicutural practices that are very similar to the practices identified in the LRMP for the MTNF.

Approximately 3281 acres, 30% of the total acres within the project area, are private lands within the project area boundary. Private citizens own approximately 93% of the lands in Missouri; therefore resident species rely heavily on habitat conditions available on private lands. While there are no actions currently known that will occur on private lands, it is likely that the pattern of use that has been established will continue. This will include pasturing, timber harvesting and re-growing of cut lands, with much of the lands expected to be left in their current conditions.

The patterns of land use on National Forest, state and private lands have been fairly consistent for the past decades. Since there are no known direct or indirect effects as a result of this project and based upon known past, present and foreseeable effects, this project is not expected to have a cumulative effect upon the Indiana bat or its habitat.

Finding of BO Compliance: The June 23, 1999 Biological Opinion requires compliance with Terms and Conditions developed to protect and maintain the Indiana bat and its habitat on the MTNF. Prescribed burning is listed as a potential direct effect to this species. This proposed project has the same effects as those discussed within the BO. The Reasonable and Prudent Measures (RPM) and associated Terms and Conditions (TC) are being met, including those as follow:

- All known Indiana bat caves remain protected from human disturbance.
- The project does not impact the designated old growth and mature forest around Indiana bat caves.
- The project will not involve activities within 0.25 mile of a known Indiana bat maternity site.
- The project will not result in loss of availability of 23 suitable roost trees/acre or result in a measurable decrease in forest canopy cover.
- Project does not affect ongoing Indiana bat monitoring or research activities.

Forested Acres Affected: The following table displays *forested* acres affected in relation to the Indiana bat as a result of the activities in the NE Corner Project Area. The table does not include open areas consisting predominantly of grasses and shrubs.

Alternative 1

Activity	FY 2004		FY 2005		FY 2006		FY 2007		FY 2008	
	NE Corner	Cumulative Forest	NE Corner	Cumulative Forest	NE Corner	Cumulative Forest	NE Corner	Cumulative Forest	NE Corner	Cumulative Forest
Prescribed burning	0	9736	0	7888	0	5902	0	3248	0	*
Timber harvest	0	11600	0	4023	0	3370	0	3297	0	*
Timber stand improvement	0	4000	0	4000	0	1422	0	400	0	*

Alternative 2

Activity	FY 2004		FY 2005		FY 2006		FY 2007		FY 2008	
	NE Corner	Cumulative Forest	NE Corner	Cumulative Forest	NE Corner	Cumulative Forest	NE Corner	Cumulative Forest	NE Corner	Cumulative Forest
Prescribed burning	0	9736	0	7888	0	5902	658	3906	0	*
Timber harvest	300	11900	900	4923	900	4270	621	3918	0	*
Timber stand improvement	0	4000	0	4000	200	1622	300	700	328	*

Alternative 3

Activity	FY 2004		FY 2005		FY 2006		FY 2007		FY 2008	
	NE Corner	Cumulative Forest	NE Corner	Cumulative Forest	NE Corner	Cumulative Forest	NE Corner	Cumulative Forest	NE Corner	Cumulative Forest
Prescribed burning	0	9736	0	7888	0	5902	0	3906	0	*
Timber harvest	300	11900	900	4923	900	4270	560	3857	0	*
Timber stand improvement	0	4000	0	4000	300	1722	350	750	382	*

***** Forested affected acres not projected for the MTNF for this year at this time.

Determination of Effect and Rationale: The NE Corner activities (all alternatives) at the locations described in this document may affect but are not likely to adversely affect the Indiana bat. There will be no additional effects outside those discussed and evaluated in the programmatic Biological Assessment or Biological Opinion.

Bald Eagle

Direct and Indirect Effects:

The following table identifies the potentially affected acres that are proposed by alternative for the NE Corner Project Area. The amount of each action is shown by Alternative. The actions proposed in Alternatives 2 and 3 would be implemented over a 5-year period beginning the year the decision is made.

Action	**Alt 1**	**Alt 2**	**Alt 3**
Timber harvesting	0	2721 acres	2660 acres
Road maint/ reconstruction	0	21.1 miles	21.1 miles
Prescribed burning	0	692 acres	34 acres

Timber harvest, road maintenance/reconstruction, prescribed burning and wildlife habitat improvement and timber stand improvement were all considered and analyzed in the programmatic BA and BO as activities needed to implement the Forest Plan. There are no activities proposed in any alternative in the NE Corner Project Area that were not discussed in the BA/BO.

Timber harvest – Removal of actual or potential communal roost trees through timber harvest is identified as a potential effect in the BA/BO. The decrease in prey base from the degradation of water quality of streams, rivers and lakes were identified as possible

indirect effects to bald eagle. All timber harvest methods considered in the NE Corner Project Area alternatives were also considered in the BA/BO. Timber harvest effects are discussed on bald eagle pages 9-11 of the BA and pages 33-35 of the BO. Timber harvest in the NE Corner Project Area would be done using the same standards and methods as described in the BA/BO; therefore, effects in the project area would be expected to be the same as those described in the BA/BO.

With no timber harvest in Alternative 1, trees within the NE Corner Project Area would increase in size through maturation, with potential for some to reach suitable size for roosting. The NE Corner Project Area is approximately 97% forested with much of the forest already mature. The number of suitable roost trees would slightly increase.

Effects of timber harvest in Alternatives 2 and 3 vary only in the amount of area affected. All harvest and tree removal activities have the potential to remove potential suitable roost trees. Under Alternatives 2 and 3, approximately 63% of the NE Corner Project Area would have no timber activity and old growth forest would be designated in portions of the project area. Timber harvest activities in Alternatives 2 and 3 will meet the terms and conditions of the BO. There would be numerous potential roost trees available remaining in the project area. All harvest area will leave den trees, snags and large live trees at the specified minimum per the BO.

The potential for soil movement off-site exists with any timber harvest activity. Impacts are likely to be minimal because no harvest will occur within riparian corridors. In addition the standards and guidelines outlined in the Land and Resource Management Plan (LRMP) for the MTNF provide mitigation measures that minimize soil erosion and maintain good water quality. Areas not harvested act as filter strips to prevent soil loss. Within the NE Corner Project Area, approximately 63 % would be unaffected by timber harvest. While the NE Corner Project Area is within the Current River watershed, it is unlikely that water quality in the Current River would be affected because of the distance to the river and the large amount of forested filter between the project area and any waterway. Therefore there would be no indirect effects on the bald eagle prey base.

Prescribed burning - Smoke produced from prescribed fire is considered to have a potential direct impact on this species. Smoke inhalation from drift also has the potential to effect the species if prevailing winds were to drift the smoke into occupied areas. This could occur if eagles were in the vicinity of the prescribed burn areas when ignited. Prescribed burning and its affects are considered in the BA on bald eagle pages 10-13 and BO pages 33 and 34. Prescribed burning also has potential to cause excess soil movement, resulting in indirect effects to bald eagles, through water quality degradation and prey base losses. Prescribed burning in the NE Corner Project Area would be done using the same standards and methods as described in the BA/BO; therefore, effects in the project area would be expected to be the same as those described in the BA/BO.

There would be no effects under Alternative 1.

Alternative 2 has 692 acres to be burned, while Alternative 3 has 34 acres. Under Alternative 2, 658 acres of pine woodlands would be prescribed burned for restoration, as well as 34 acres of open lands. Under Alternative 3, only 34 acres of native warm season grasses would be burned. The nearest eagle nest and communal night roost is 18.5 and 16 miles, respectively, from the project area. The potential for eagles to be passing through exists but is low, considering that there are no perennial streams located within any of the burn units. Prescribed burns are usually completed when weather conditions are conducive to smoke dispersal with minimum requirements for mixing height and transport winds.

Potential indirect effects include the loss of the species' prey base due to the degradation of water quality in streams, rivers and lakes that may negatively impact the forage base. Mitigation measures, as described in the burn plans for these areas, will reduce the chance of soil loss on firelines. The Land and Resource Management Plan (LRMP) for the Mark Twain National Forest provide recommendations that minimize soil erosion and maintain good water quality. No potential roost trees are expected to be killed with the implementation of this project because of the low intensity at which the areas will be burned.

In the past 20 years, bald eagles have increased in numbers; have been downlisted from Endangered to Threatened; and are now proposed for delisting.

Road maintenance/reconstruction – Road maintenance/reconstruction was one of the activities was one of the activities identified as having potential to cause excess soil movement, resulting in indirect effects to bald eagles, through water quality degradation and prey base losses. Road maintenance/reconstruction are discussed on bald eagle pages 9-12 of the BA and page 35 of the BO. Road construction could also result in the removal of individual trees that could be potential roost trees. Road maintenance/reconstruction in the NE Corner Project Area would be done using the same standards and methods as described in the BA/BO; therefore, effects in the project area would be expected to be the same as those described in the BA/BO.

With no road maintenance in Alternative 1, there would be potential for erosion from poorly maintained roads. However, it is unlikely that there would be enough soil movement to cause indirect effects by adversely affecting the bald eagle prey base.

Alternatives 2 and 3 have 21.1 miles of road maintenance/reconstruction. Most roads on the MTNF are ridgetop roads with high clay/rock content. Rocks serve as filters to trap small particles to reduce movement off-site. High clay content binds soil particles, which too reduces the amount of particles that move off-site. Most of the roads within the NE Corner Project Area to be maintained are ridgetop roads.

Maintenance of the roads within the NE Corner Project Area will reduce the erosion potential and thereby will not contribute to water quality degradation of the Current River. The bald eagle prey base would not be affected because of the lack of erosion

Cumulative Effects: Activities in the past 2 decades in the NE Corner Project Area include other timber harvests, wildfire and wildfire suppression, wildlife habitat improvement, and road construction and maintenance. Activities under Alternatives 2 and 3 include timber harvest, road maintenance/reconstruction and prescribed burning. Other future actions or projects on the Doniphan/Eleven Point District include prescribed burning of the DD Savanna, which is 1 mile south of the NE Corner Project Area, but 4 miles south of the 658 acre unit proposed for shortleaf pine woodland restoration in Alternative 2. There are no caves, permanent streams or rivers in the project area.

The NE Corner Project Area is approximately 97% forest cover. Under Alternatives 2 and 3, the NE Corner Project Area will remain 97% forested, based on vegetation analysis and stand prescriptions from the District Silviculturist.

Peck Ranch State Conservation Area (23, 098 acres) borders the NE Corner Project Area on the east side. Management activities within this area include prescribed burning of warm season grasses, dolomite glades, igneous knobs and pine woodland restoration sites. An average of 2000 acres are burned annually. Expectations are to burn 52%, approximately 12,000 acres, of the Conservation Area on a rotational basis. Prescribed burning has been conducted for several years in conjunction with silvicutural practices that are very similar to the practices identified in the LRMP for the MTNF.

Approximately 3281 acres, 30% of the total acres within the project area, are private lands are within the project area boundary. Private citizens own approximately 93% of the lands in Missouri; therefore resident species rely heavily on habitat conditions available on private lands. While there are no actions currently known that will occur on private lands, it is likely that the pattern of use that has been established will continue. This will include pasturing, timber harvesting and re-growing of cut lands, with much of the lands expected to be left in their current conditions.

The patterns of land use on National Forest, state and private lands have been fairly consistent for the past decades. Since there are no known direct or indirect effects as a result of this project and based upon known past, present and foreseeable effects, this project is not expected to have a cumulative effect upon the bald eagle or its habitat.

Finding of BO Compliance: The June 23, 1999 Biological Opinion requires compliance with Terms and Conditions developed to protect and maintain the bald eagle and its habitat on the MTNF. Prescribed burning is listed as a potential direct effect to this species. This proposed project has the same effects as those discussed within the BO. The Reasonable and Prudent Measures (RPM) and associated Terms and Conditions (TC) are being met, including those as follow:

- The project does not inhibit ongoing annual surveys for bald eagles.
- The project does not impact any known winter roost sites.
- The project does not occur along the water's edge adjacent to known wintering areas; therefore, does not change the structure, composition, or natural function of the riparian vegetation or community.

- The project does not impact super-canopy trees along major riverways or lakes.
- The project does not involve or influence controlled burning activities that may impact bald eagles.

Determination of Effect and Rationale: The NE Corner activities (all alternatives) at the locations described in this document may affect but are not likely to adversely affect the bald eagle. There will be no additional effects outside those discussed and evaluated in the programmatic Biological Assessment or Biological Opinion.

SUMMARY OF DETERMINATIONS

The summary of determinations below is based upon the proposed management action as described in this evaluation. *Should any change in the proposed management action as outlined in this evaluation occur after the date that this evaluation is signed, all effects upon these federally-listed species may warrant re-evaluation before project implementation may continue.* Changes that would require a re-evaluation of effects upon these species include but may not be limited to:

- Any change in the proposed action that may increase the potential for adverse effects upon federal species beyond what has been disclosed in this evaluation;
- Unknown or previously unaddressed federal species or their habitats are discovered in the "project affected area".

Species	Species present in "project affected area"?	Habitat present in "project affected area"?	Habitat affected by project?	Determination
Scaleshell mussel	**No;** range not within project area	**No**	**No**	**Not applicable to this project.**
Topeka shiner	**No;** not known south of Missouri River	**No**	**No**	**Not applicable to this project.**
Tumbling creek cavesnail	**No**; range not within project area	**No**	**No**	**Not applicable to this project.**
Running buffalo clover	**No**; range not within project area	**No**	**No**	**Not applicable to this project.**
Mead's milkweed	**No**; no habitat within project affected area	**No**	**No**	**Not applicable to this project.**
Hine's emerald dragonfly	**No**; range not within project area	**No**	**No**	**Not applicable to this project.**
Curtis' pearly mussel	**No;** range not within project area	**No**	**No**	**Not applicable to this project.**
Pink mucket pearly mussel	**No;** range not within project area	**No**	**No**	**Not applicable to this project.**
Gray bat	**Possible;** no documented occurrence	**No**	**No**	**May affect - Not likely to adversely affect** - No affects outside those discussed/evaluated in the programmatic BA and BO
Indiana bat	**Possible;** may roost in suitable trees; particularly during migration	**Yes**; possible roosting habitat	**Yes**	**May affect - Not likely to adversely affect** – No affects outside those discussed/evaluated in the programmatic BA and BO
Bald eagle	**Possible**; no documented occurrence	**No**	**No**	**May affect - Not likely to adversely affect** – No affects outside those discussed/evaluated in the programmatic BA and BO

CONSULTATION WITH OTHERS

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Prepared by:

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Biological Evaluation – Regional Forester Sensitive Species
NE Corner Project Area

Mark Twain National Forest
Doniphan/Eleven Point Ranger District
Shannon County, Missouri
September 3, 2003

A. Introduction:

Project Area Size: 7414 acres
Landtype Association: Oak – Pine Hills (HI) and Oak-Pine Breaks (BB).
Management Area: 4.1-12
Project Location: The NE Corner Project Area totals 7414 acres. The area includes: Compartments 280, 281, 282, 283, 284, 285, 286 and 287 in Township 24N, Range 3 West, Sections 1-6, 9-16, 23-28 and 36; Shannon County, Missouri.

B. Sensitive Species:

1. List all sensitive species (not including federal TE) known or expected to be in the project area or that the project potentially affects:

- According to the Missouri Heritage Database, there are two Regional Forester Sensitive Species (RFSS) documented in the NE Corner Project Area. The epiphytic sedge (*Carex decomposita*) and pale mana grass (*Torreychloa pallida*) have been documented in the Marg Pond Natural Area, which is within compartment 280, stand 4 of the NE Corner Project Area. This area is protected and will not be disturbed with any activity in the NE Corner Project Area. These species occur in wet areas, such as sinkholes or other emergent wetland type of habitat.

- Special habitats within the project area include Marg Pond Natural Area, sink holes, a small bog, shortleaf pine woodlands, small ponds, native warm season grass open lands and one glade approximately 0.5 acres in size in Compartment 286.

- There are no caves, springs or fens in the NE Corner Project Area.

- MOFWIS identified Swainson's warbler as known or likely to exist in Shannon County. This species is a riparian species associated with canebrakes within extensively forested landscapes along stream and river flood plains. There are no permanent streams or rivers within the NE Corner Project Area and no associated canebrakes. There is no existing habitat for the Swainson's warbler within the NE Corner Project Area.

- The NE Corner Project Area does contain potential habitat for some RFSS. These species will be evaluated in this BE, because project activities may affect or enhance some of the potential suitable habitat. The following table depicts those species that have potential suitable habitat.

Species Scientific Name	Species Common Name	Possible Location/Habitat
Aimophila aesitvalis	Bachman's sparrow	Open pine woods, old fields
Lanius ludovicianus	Loggerhead shrike	Open areas with scattered trees
Agalinis auriculata	Earleaf foxglove	Dry prairie, fallow field
Calamagrostis porteri	Ofer Hollow reedgrass	Rocky, open slopes
Carex decomposita	Epiphytic sedge	Sinkhole ponds – Marg Pond NA
Carex straminea	Straw sedge	Sinkhole ponds
Echinacea simulata	Wavy-leaf purple-coneflower	Glades, savannas, roadsides
Hottonia inflata	Feather foil	Sinkhole ponds, tupelo swamps
Matelea baldwyniana	Baldwin's milkvine	Open, rocky woods, edges of glades
Potamogeton pulcher	Spotted pondweed	Sinkhole ponds
Rudbeckia fulgida var speciosa	Orange coneflower	Moist opening, ledges, glades, low woods
Scutellaria bushii	Bush's skullcap	Glades and bald knobs in Ozarks
Silene regia	Royal catchfly	Rocky, open woods, glade edges, savannas
Solidago gattingerii	Gattinger's goldenrod	Glades, bald knobs
Sullivantia sullivantia	Sullivantia	Moist, shaded north facing slopes in Ozarks
Trillium pusillum var ozarkanum	Ozark trillium	Thin cherty soils
Sphagnum centrale	Sphagnum	Bogs, wet ledges, sandy creek banks

Other species, for which habitat potentially exists, will also be discussed.

The eighteen (18) species identified as having potential suitable habitat in the project area will be evaluated in this BE.

Other RFSS that are not included in this evaluation are those that have no documented occurrences in Missouri, do not occur in Shannon County, or do not have any potential suitable habitat within the project area.

2. Identify and describe the essential occupied or unoccupied habitat for the species in the project area.

There is no designated essential habitat, either occupied or unoccupied for any regional forester sensitive species in the project area.

C. Effects Analysis

1. Provide an analysis of the effects of the proposed action on the affected species or their occupied habitat.

Since the only documented occurrences of any RFSS species are those within the Marg Pond Natural Area, and no activities within any Alternative will occur within this area, there would be no direct affects on species or occupied habitat from implementation of any of the Alternatives in the NE Corner Project Area.

The following is an analysis of indirect effects to RFSS species with potential suitable habitat in the project area. Alternative 1 is the no action alternative. With this Alternative, there would be no activity within dry, open woods or moist north slope forested stands. The forest would continue to age and would be affected by natural disturbances only. Early successional habitats would decline as mature and overmature forest increased. The presence of habitat suitable to some of the RFSS listed below would depend on the occurrence of natural disturbances. Alternatives 2 and 3 have management activities that will create a forest structure that would have all age-classes represented.

Alternative 2 includes silvicultural treatments such as: commercial thinning, pre-commercial thinning, shelterwood/seed cuts, clearcuts, shelterwood preparatory cuts and salvage, as well as prescribed burning of 692 acres. Of the 692 acres to be burned, 658 acres will be burned as a single unit (Big Hollow Prescribed Burn), in order to restore a

Shortleaf pine woodland ecosystem. The remaining 34 acres will be burned in a native warm season grass stand. In Alternative 3, the 34 acres of native warm season grasses will be burned, but the 658-acre Shortleaf pine woodland will not be. Only silvicutural treatments, like those mentioned for Alternative 2, will be used in the project area.

- *Aimophilia aesitvalis* is a small sparrow that historically occupied glades and open pinewoods in Missouri. Their population has diminished because of the pine logging practices that occurred in the past. Bachman's sparrow has been documented in Oregon County. In Alternative 2, a 658- acre area will be burned in order to restore a Shortleaf pine woodland community. Prescribed burning of this area will provide the typical open conditions needed for Bachman's sparrow. Alternative 1 will allow the forest to continue to mature and the canopies to become closed. Alternative 3 will provide varying canopy densities through silvicutural practices, but will not promote the pine woodland habitat.

- *Lanius ludovicianus* is small bird of prey that feeds on a variety of species, including mice, insects and small birds. Typically, it is a bird of open country that is known to frequent overgrown fields with thorny trees and brush that assist them with defense and hunting. Prescribed burning the 34-acre native warm season grass stand will continue to provide suitable habitat with Alternatives 2 and 3. Other areas that were previously open to semi-open will become more dense and woody through succession. With Alternative 1, these areas will grow up and suitable habitat will be lost.

- *Agalinis auriculata* is a semi-parasitic species that is found in dry prairies and fallow fields. Prescribed burning will help to maintain and or convert areas in a more open condition, which would promote the opportunity for this species to potentially inhabit areas. This species is not known to exist in the project area. Under Alternative 1, the areas will grow up and potential suitable habitat will be lost through succession. Alternative 2 and 3 will create varying degrees of open conditions through silvicultural practices. Alternative 2 also contains a 658 acre prescribed burn unit that will restore a shortleaf pine woodland and will provide an open condition that may favor the species. There will be no treatments in any of the open field areas, other than prescribed fire.

- *Calamagrostis porteri* is found on shaded ledges on tops of bluffs with mesic upland forests, usually on acidic substrates, often on north-facing exposures. Vegetatively, the plants are distinct within their habitats and flowering is uncommon and very sporadic. The species is not known to exist in the project area. Alternative 1 would allow the canopy to continue to close and eventually near 100% closure. Alternatives 2 and 3 create varying amounts of canopy closure and forest floor exposure that may provide potential habitat for this species.

- *Carex decomposita* is scattered in the eastern portion of the Ozark Division. It is an emergent aquatic in sinkhole ponds, usually epiphytic on the bases of buttonbushes. This species is an indicator of high-quality sinkhole pond communities. It has been

documented within the NE Corner Project Area in the Marg Pond Natural Area. This Missouri Natural Area is protected from any treatments in the NE Corner Project Area. Other sinkholes exist within the project area, but there are no documented populations of this species. All sinkholes are protected, with buffer zones, from any activities within the NE Corner Project Area.

- *Carex straminea* is uncommon and known only from Shannon County. This sedge inhabits the margins of sinkhole ponds, roadside ditches and in some cases emergent aquatics. It is has not been documented within the project area in any of the sinkhole ponds. All sinkholes are protected, with buffer zones, from any activities within the NE Corner Project Area.

- *Echinacea simulata* is found on savannas and glades and has a narrow range. The species is not known to exist on the project area. There is one glade, approximately 0.5 acres in size in compartment 286, stand 27. This stand is scheduled for a clear-cut with natural regeneration treatment under Alternative 2 and 3. This stand is not within the planned prescribed burn areas.

- *Hottonia inflata* inhabits sinkhole ponds and tupelo swamps in Southeast Missouri. This species has not been documented in the NE Corner project area in any of the sinkhole ponds. All sinkholes are protected, with buffer zones, from any activities within the NE Corner Project Area.

- *Matelea baldwyniana* is known in just over 30 locations, mostly in Missouri and Arkansas. Intensive forestry practices have decimated the population. The plant is found mostly in the southwest portion of Missouri. This species may find suitable habitat once the canopy is opened up from implementation of Alternative 2 and 3. It is not known to exist within the NE Corner Project Area.

- *Potamogeton pulcher* is a characteristic plant of upland sinkhole ponds in the Ozarks. It is aquatic in sinkhole ponds and sluggish streams and is sometimes emergent on mudflats. This species is not known to exist in sinkholes within the NE Corner Project Area. All sinkholes are protected, with buffer zones, from any activities within the NE Corner Project Area.

- *Rudbeckia fulgida var speciosa* is found on glades, moist openings and ledges. This species has not been documented within the NE Corner Project Area. Alternative 1 would promote canopy closure, while Alternatives 2 and 3 will provide varying degrees of canopy closure that may provide potential suitable habitat for this species.

- *Scutellaria bushii* is found on limestone glades and bald knobs within the Ozarks. It has been documented in Missouri in 10 counties, but only on approximately 75 occurrences. There is one small glade in Compartment 286; however, this species has not been documented within the NE Corner Project Area.

- *Silene regia* prefers to grow in well-drained, open, rocky woods. This plant responds dramatically to prescribed fire. Higher adult survival and higher recruitment are indicative responses when affected by fire. With implementation of Alternative 2, potential suitable habitat may be created. With Alternative 1 the areas will have a dense canopy closure not conducive as suitable habitat for this species. Alternative 3 will have differing amounts of canopy closure, but will not include the 658-acre Big Hollow burn unit. This species has not been documented in the NE Corner Project Area.

- *Solidago gattingerii* inhabits glades and bald knobs. Within the NE Corner Project Area, there is one small 0.5-acre glade. This species has not been documented within the NE Corner Project Area.

- *Sullivantia sullivantia* grows on moist, shaded north facing slopes in the Ozarks. It is imperiled within Missouri and has not been documented within the NE Corner Project Area.

- *Trillium pusillum var ozarkanum* is a species that is somewhat tolerable to disturbance. It is found in dry to mesic upland woods in both oak-hickory stands and mixed hardwood-pine forests. The species is not known to require fire in its natural habitat and fire can be beneficial or adverse depending upon the frequency and seasonability. However, a partially open canopy enhances the species ability to reproduce. Implementation of the project that provides a partially open canopy may provide potential suitable habitat. This species has not been documented within the NE Corner Project Area. With Alternative 1, the canopy will close, the understory will become dense and potential suitable habitat will be lost.

- *Sphagnum centrale* is a peat moss that grows in bogs and wet areas. This species has not been documented within the NE Corner Project Area. Potential suitable habitat exists within the existing sinkhole ponds and ponds. All sinkholes are protected, with buffer zones, from any activities within the NE Corner Project Area.

- At the closest point, the burn units are approximately 7 miles from the Eleven Point National Scenic River and about 20 miles from Current River. Forest Plan standards and guidelines for prescribed burning will insure that there is minimal, if any, potential for soil movement off-site. Mitigation measures have been incorporated into the burn plans to promote soil conservation. There will be no alteration to the river systems and no sediment reaching the Eleven Point or Current Rivers, therefore, there would be no effect on aquatic species or their habitat.

2. Discuss the cumulative effects resulting from the planned project:

Activities in the past 2 decades in the NE Corner Project Area include other timber harvests, wildfire and wildfire suppression, wildlife habitat improvement, and road construction and maintenance. Activities under Alternatives 2 and 3 include timber

harvest, road maintenance/reconstruction and prescribed burning. Other future actions or projects on the Doniphan/Eleven Point District include prescribed burning of the DD Savanna, which is 1 mile south of the NE Corner Project Area, but 4 miles south of the 658 acre unit proposed for shortleaf pine woodland restoration in Alternative 2.

The NE Corner Project Area is approximately 97% forest cover. Cumulative effects of any on the alternatives considered for the NE Corner Project is that the area will remain 97% forested, based on vegetation analysis and stand prescriptions from the District Silviculturist.

Peck Ranch State Conservation Area (23, 098 acres) borders the NE Corner Project Area on the east side. Management activities within this area include prescribed burning of warm season grasses, dolomite glades, igneous knobs and pine woodland restoration sites. An average of 2000 acres are burned annually. Expectations are to burn 52%, approximately 12,000 acres, of the Conservation Area on a rotational basis. Prescribed burning has been conducted for several years in conjunction with silvicutural practices that are very similar to the practices identified in the LRMP for the MTNF.

Approximately 3281 acres, 30% of the total acres within the project area, are private lands are within the project area boundary. Private citizens own approximately 93% of the lands in Missouri; therefore resident species rely heavily on habitat conditions available on private lands. While there are no actions currently known that will occur on private lands, it is likely that the pattern of use that has been established will continue. This will include pasturing, timber harvesting and re-growing of cut lands, with much of the lands expected to be left in their current conditions.

The patterns of land use on National Forest, state and private lands have been fairly consistent for the past decades. Since there are no known direct or indirect effects as a result of this project and based upon known past, present and foreseeable effects, this project is not expected to have a cumulative effect upon the bald eagle or its habitat.

There are no direct effects on any regional sensitive species, because the only documented occurrences of any RFSS are within a state designated Natural Area that will not have any acitivites in any of the alternatives. No other RFSS species are known within the NE Corner Project Area.

RFSS

Biological Evaluation

Summary of Conclusion of Effects
NE Corner Project Area

Common Name	Alternative 1	Alternative 2	Alternative 3
Bachman's sparrow	NI	BI	NI
Loggerhead shrike	MIIH	MIIH	MIIH
Earleaf foxglove	MIIH	BI	BI
Ofer Hollow reedgrass	NI	BI	BI
Epiphytic sedge	NI	NI	NI
Straw sedge	NI	NI	NI
Wavy-leaf purple-coneflower	NI	NI	NI
Feather foil	NI	NI	NI
Baldwin's milkvine	NI	BI	BI
Spotted pondweed	NI	NI	NI
Orange coneflower	NI	NI	NI
Bush's skullcap	NI	NI	NI
Royal catchfly	NI	BI	NI
Gattinger's goldenrod	NI	NI	NI
Sullivantia	NI	NI	NI
Ozark trillium	NI	BI	BI
Sphagnum	NI	NI	NI

NI = No Impact (no affect or habitat maintained)
MIIH = May Impact Individuals or Habitat, but will not likely contribute to a trend towards federal listing or loss of viability to the population or species (habitat reduced – consider extent and consequences)
WIFV* = Will Impact individuals or habitat with a consequence that the action may contribute to a trend towards Federal listing or cause a loss of Viability to the population or species (habitat destroyed – consider extent and consequences)
BI = Beneficial Impact (habitat created or enhanced)

*Trigger for a Significant Action as defined in NEPA

Prepared by: /s/ *Keith P. Kelley* *September 3, 2003*

Wildlife Biologist Date

Biological Evaluation – State Endangered Species
NE Corner Project Area

Mark Twain National Forest
Doniphan/Eleven Point Ranger District
Shannon County, Missouri
September 9, 2003

Introduction:

Project Area Size: 7414 acres
Landtype Association: Oak – Pine Hills (HI) and Oak-Pine Breaks (BB).
Management Area: 4.1-12
Project Location: The NE Corner Project Area totals 7414 acres. The area includes: Compartments 280, 281, 282, 283, 284, 285, 286 and 287 in Township 24N, Range 3 West, Sections 1-6, 9-16, 23-28 and 36; Shannon County, Missouri.

Summary of Proposed Action: There would be no vegetation management in Alternative 1. The proposed action for scoping was Alternative 2. The likely preferred alternative for the NE Corner project area is Alternative 2. Specific actions identified in Alternative 2 are: designate 709 acres old growth; maintain 34 acres of open and semi-open habitat by prescribed burning; harvest 338 acres of clearcuts, 33 acres of shelterwood/seed cut, 88 acres of seed tree/seed cut, 57 acres shelterwood preparatory cut, 114 acres of salvage harvest; reforestation of 314 acres by natural regeneration, 189 acres of planting and release; 431 acres of group selection with improvement cut, which includes follow-up reforestation on 42 acres of groups and 389 acres of TSI/reforestation between groups, 1660 acres of thinning, and precommercial thinning of 439 acres; and prescribed burning of 658 acres for Shortleaf pine woodland restoration. Alternative 3 consists of similar activities, but differs in the amount of acres for individual stand treatments. Alternative 3 does not include burning the 658 acre prescribed burn unit.

Seven state endangered species are identified as known or likely to occur in Shannon County according to the MOFWIS database ran on 8/6/03. These are gray bat and Indiana bat (also Federal Endangered) bald eagle (also Federal Threatened), Swainson's warbler (also RFSS) and northern harrier, eastern spotted skunk and barn owl.

Cooper's hawk and sharp-shinned hawk were documented in the NE Corner Project Area in 1988.

Direct and Indirect Effects

Gray bat, Indiana bat and bald eagle are evaluated in the Federal Biological Evaluation for this project. Swainson's warbler was addressed in the Regional Forester Sensitive Species Biological Evaluation.

The following is a description of state endangered species that have potential habitat within the NE Corner Project Area.

- Northern harrier is a winter resident that requires large open grasslands. Open lands within the NE Corner Project Area might provide suitable habitat. Alternative 1 will aid in the formation of a dense canopy and succession of open lands to more forested conditions and will result in the loss of potential habitat. Alternatives 2 and 3 include prescribed burning of portions of the project area, which will maintain open lands. Of the existing open lands, 34 acres of native warm seasons grasses will be burned in Alternatives 2 and 3. Prescribed burning of this area will maintain the open land component desired by this species.

- Barn owls are often associated with open grasslands and are believed to have been widespread in Missouri in the early 1900's. Their population has suffered because of a change in farming methods, the removal of barns and other open buildings and the use of rodenticides. The nearest documented breeding pair of barn owls is located in the bootheel of Missouri. Barn owls are not known to exist within the NE Corner Project Area. Under Alternative 1, no burning or activities will be implemented in order to maintain the open conditions this species requires. Alternatives 2 and 3 will maintain or enhance a portion of the open lands, 34 acres of native warm season grasses, and will provide potential suitable habitat for this species.

- The plains spotted skunk is considered a glade or rocky woodland species. There is one glade within the NE Corner Project Area. The glade is within stand 27, which is scheduled to be clearcut. This species has not been documented in the project area. Alternative 1 will not include any treatments and will allow canopy closure of the project area, as well as succession of open lands to forested conditions. Alternatives 2 and 3 have similar silvicutural treatments. However, Alternative 2 includes the 658-acre Big Hollow Burn Unit that will restore a grassy open vegetative understory within the burn that would increase the foraging base for this species. Also, snags and downed trees may be created from the prescribed burns that may provide foraging and den areas for this species.

- Cooper's hawk was last documented in Compartment 287, Stand 1 in 1988. This species is an uncommon migrant statewide. It is a rare summer resident statewide. This species declined dramatically across its range because of the use of organochloride pesticides. Cooper's hawk populations have stabilized across much on the Northeast and Midwest in the past two decades. This species is commonly found nesting in forested areas. Within the NE Corner Project Area, no activities will take place in this stand; therefore there will be no direct effects to this species.

- Sharp-shinned hawk was last documented in the NE Corner Project Area in Compartment 284, Stand 15, in 1985. This species is an uncommon migrant statewide. In 1988, the nest was inactive and the birds were not present. With Alternative 1, no activities will take place in this stand. Alternative 2 and 3 have commercial thinning scheduled for this stand. Care will be taken to make sure the hawk is either not present or that a buffer around the nest is left in order to ensure there are no direct effects to this species.

Based on the information discussed above, there would be no direct affects on any species in the NE Corner Project Area or occupied habitat from implementation of Alternatives 2 & 3.

Cumulative Effects

Activities in the past 2 decades in the NE Corner Project Area include other timber harvests, wildfire and wildfire suppression, wildlife habitat improvement, and road construction and maintenance. Activities under Alternatives 2 and 3 include timber harvest, road maintenance/reconstruction and prescribed burning. Other future actions or projects on the Doniphan/Eleven Point District include prescribed burning of the DD Savanna, which is 1 mile south of the NE Corner Project Area, but 4 miles south of the 658 acre unit proposed for shortleaf pine woodland restoration in Alternative 2.

The NE Corner Project Area is approximately 97% forest cover. Cumulative effects of any on the alternatives considered for the NE Corner Project is that the area will remain 97% forested, based on vegetation analysis and stand prescriptions from the District Silviculturist.

Peck Ranch State Conservation Area (23, 098 acres) borders the NE Corner Project Area on the east side. Management activities within this area include prescribed burning of warm season grasses, dolomite glades, igneous knobs and pine woodland restoration sites. An average of 2000 acres are burned annually. Expectations are to burn 52%, approximately 12,000 acres, of the Conservation Area on a rotational basis. Prescribed burning has been conducted for several years in conjunction with silvicutural practices that are very similar to the practices identified in the LRMP for the MTNF.

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The patterns of land use on National Forest, state and private lands have been fairly consistent for the past decades. Since there are no known direct or indirect effects as a

result of this project and based upon known past, present and foreseeable effects, this project is not expected to have a cumulative effect upon the bald eagle or its habitat.

There are no direct effects expected on any state endangered species. The only documented occurrences of state endangered species are in stands that have no activity or are in stands where a buffer protection zone will be created. No other state endangered species are known within the NE Corner Project Area.

Prepared by: /s/ *Keith P. Kelley* *September 9, 2003*

Wildlife Biologist Date